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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/633,364

08/01/2003

Anna Chwang

UDC-26601

5131

27774

7590

01/06/2005

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EXAMINER

GUHARAY, KARABI

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 01/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/633,364

Applicant(s)

CHWANG ET AL.

Examiner

Karabi Guharay

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01/05/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

Drawings

Figures 1A, 1B & 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-4, 6, 12, 20-24, 26, 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Heeks et al. (US 5965901).

Regarding claims 1, 3-4 & 6 Heeks et al. disclose an organic light emitting device structure (Fig 2) comprising a substrate (a glass sheet 1) a first electrode that is an anode electrode (2) comprising ITO disposed over the substrate, a conductive polymer (PEDT/PSS layer 3) disposed over the first electrode (anode 2) an organic region (4) consisting of small molecule material (PPV) disposed over and in contact with the polymer layer (3), a second electrode (cathode 5), disposed over the organic region and

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a thin film encapsulation (glass epoxy layer, not shown in Fig 2) over the cathode (lines 7-18 of column 5).

Regarding claim 12, Heeks et al. disclose that the organic layer comprising small molecule material PPV which is a small molecule emissive material (line 17 of column 5).

Regarding claims 20-22, Heeks et al. disclose that the conductive polymer is selected from polypyrroles, polyanilines, poly(p-phenylene vinylenes), polysulfones, polyacetylenes, and polythiophenes, wherein the polymer layer (3) comprises poly(3,4-ethylenedioxythiophene) and further comprises a poly(styrene sulfonate) (polymer used is PEDT/PSS, lines 13-14 of column 5).

Claims 23-24 recite methods used to form the polymeric layer. However the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Regarding claim 26, Heeks discloses an organic light-emitting device (see Fig 2) comprising a polymer layer (PEDT/PSS layer 3) and a small molecule layer (PPV layer see lines 7-17 of column 5).

Claims 30-32 recite essentially the same limitations of claims 20-22 respectively. Thus claims 30-32 are rejected as claims 20-22 (see rejection of claims 20-22).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-4, 6-7, 12-19 & 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Araki (US 6621840).

Regarding claims 1, 3-4, 6 & 12, Araki discloses an organic light emitting device (See Drawing) comprising a substrate (glass or metal, line 49-50 of column 4) a first electrode (transparent anode electrode, made of ITO), a polymeric layer comprising conductive polymer disposed over the first electrode (not shown, see 15-17 of column 4), a organic region consisting essentially of small molecule material (Alq, lines 11-13 of column 6) and in direct contact with the polymeric layer (lines 4-5 and 15-17 of column 4), a second electrode (cathode electrode) disposed over the organic region and a thin film encapsulation region (not shown, lines 30-32 of column 7).

Regarding claim 7, Araki discloses that the substrate is a composite material comprises a polymer substrate (lines 55-59 of column 4), a plurality of f high-density layers and planarizing layers which may be same or different (lines 57-65 of column 2).

Regarding claims 13-19, Araki discloses a multiplayer structure for the organic region comprising a hole injection layer, a hole transport layer, an emission layer a blocking layer and electron transport layer disposed sequentially (lines 1-20 of column 4) and the hole injecting layer comprises small molecule organic metal complex CuPc (lines 23-27 of column 5).

Regarding claim 26, Araki discloses an OLED comprising a polymer layer comprising a hole injecting conductive material (lines 25-267 of column 5) and a small molecule layer comprising a small molecule emissive material (lines 11-12 of column 6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 5, 7-11, 15, 19 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heeks et al. as applied to claim 1 above, and further in view of Weaver (US 2003/0085652).

Regarding claims 2 & 5, Heeks teaches all the limitations of claim 2 and 5 except for OLED device being flexible and Heeks teaches aluminum-lithium alloy material for cathode instead of aluminum and lithium fluoride layer as cathode.

However, in the same field of OLED, Weaver teaches a flexible OLED device using flexible substrate (see Paragraph 0049) which can be used in various applications for flexibility and also teaches various suitable materials such as aluminum –lithium or aluminum and lithium fluoride layer (see paragraph 0031) for cathode in an organic light emitting device.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a flexible substrate as taught by Weaver, in the device of Heeks so as to obtain a flexible OLED which is highly desirable (paragraph 0051) has various applications for being flexible, and further use Aluminum and lithium fluoride layer as the composition for cathode layer, since it has been held to be within

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the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

Regarding claims 7-11, Heeks discloses an encapsulation layer and a substrate for encapsulating the OLED, but is silent about the details of the encapsulation layer and a substrate.

However, Weaver, in the same field of OLED device, discloses that the substrate for the OLED comprises a polymer substrate (see paragraph 0049), a plurality of high density layers and a plurality of planarizing layers (122a-c and 121a-c of Fig 2) which are same (see paragraph 0053), and planarizing layers are same, comprising at least three pairs of alternating high-density and planarizing layers (paragraph 0050) and the encapsulating region (cover, see Fig 4) is a multiplayer region having a plurality of high density layers and a plurality of planarizing layers (322a-c and 321a-c), comprising at least three pairs of alternating high density layer and planarizing layers (paragraph 0057). This type of encapsulation structure acts as a composite barrier with good resistance to moisture and oxygen penetration (see paragraph 0051), which will protect the OLED.

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use composite barrier structure as taught by Weaver, in the device of Heeks et al. since this will protect the device from environmental oxygen and moisture.

Regarding claims 15 & 19, Weaver discloses that the organic region (144 of Fig 2) comprises a multilayer region including a hole injection layer, a hole transporting

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layer, an emission layer a blocking layer and an electron transport layer (paragraph 0028). The same reason for combining art as in claim 2 applies.

Regarding claim 25, Heeks and Weaver discloses all the limitations of claim 25 (see rejection of claim 7 & 21 & 15), but does not disclose that the hole-injecting layer is CuPc. However, CuPc is a well-known suitable material for hole-injection purpose.

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use CuPc as the material for hole-injecting layer since selection of known material for suitable purpose is within the skill of art.

Claims 13-14, 16-18, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heeks et al. applied to claim 1 above, and further in view of Suzuki et al. (US 6528188).

Regarding claims 13-14, 16-18 & 27-29, Heeks discloses an organic region comprising a small molecule emissive material, but does not disclose a multi-layer structure for the organic region.

However, Suzuki et al. teach a multi-layer structure for the organic region of an organic light emitting device, such laminated structures are internal junction organic EL devices having hole injection layer (3a), hole transport layer (3b), emission layer electron injection layer in order to produce a multicolor emission (lines 15-20 of column 1), and disclose a small molecule organic metal complex, CuPc, as the material for the hole injecting layer (lines 14-15 of column 12).

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Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use multi-layer structure for the organic region as discloses by Suzuki et al. in the device of Heeks et al. in order to have multicolor emission.

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure :

Hayashi et al. (US 6791660); Forrest et al. (US 6596134); Lin et al. (US 6759145) ;

Teach that CupC is a well known hole injecting material.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (571) 272-2452. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karabi Guharay
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Patent Examiner
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